UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,175	02/13/2004	Wen-Yuan Yeh	11836-US-PA	2174

31561 7590 10/13/2004

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER
CHEN, JACK S J

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/708,175	YEH, WEN-YUAN	
	Examiner	Art Unit	
	Jack Chen	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *04 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *3-7 and 11-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 8-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

In response to the communication filed on August 4, 2004, claims 1-20 are active in this application.

Claims 3-7 and 11-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on August 4, 2004.

Applicant's election with traverse of the Species combination A-2 and B-2 (claims 1-2 and 8-10) in the reply filed on August 4, 2004 is acknowledged. The traversal is on the ground(s) that 1) the claimed inventions are not able to support separate patents and they are not distinct species and 2) the claimed inventions are neither independent or distinct, but vary only in breath and scope. This is not found persuasive because (1) for the reasons as shown in the previous office action (i.e., forming the gate without metal silicide as shown in applicant's specification, see paragraph 0011 or forming the gate with metal silicide as shown in applicant's specification, see paragraph 0012; using in-situ doping method as shown in the applicant's specification, see paragraph 0014 or using ion implantation method as shown in the applicant's specification, see paragraph 0022), therefore, each of the above methods for forming the device is capable of support separate patents; further in this regard, should applicant traverse on the ground that the species are not patentably distinct, ***applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case***. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35

U.S.C. 103(a) of the other invention and 2) the claimed inventions are not only varied in breath and scope because they directed to specific/distinct (i.e., ion implantation method is different from in-situ doping) methods for forming the device. Furthermore, the proposed processes would require a diversity field of search, it would require undue burdensome search to examine all species.

The requirement is still deemed proper and is therefore made FINAL.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Oath/Declaration

Oath/Declaration filed on February 13, 2004 has been considered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 9, line 3, the phrase "the solid indium chloride" lacks antecedent basis.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Matsuo, U.S. Pub. No. 2004/0000695 A1.

Matsuo discloses a method for forming a semiconductor device, which comprises providing a substrate 100 (fig. 1A); forming a gate dielectric layer 102 over the substrate (fig. 1A); forming an indium doped polysilicon layer 106 over the gate dielectric layer (fig. 1B); patterning the indium doped polysilicon layer and the gate dielectric layer to form a gate 110 (fig. 2A); and forming an N-doped region 114a/114b in the substrate on each side of the gate (fig. 2B), see figs. 1A-8C; pages 1-11 for more details.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo, U.S. Pub. No. 2004/0000695 A1 taken with Yao et al., U.S./6,455,330 B1 and in view of Gerritsen et al., U.S./6,281,556 B1.

Matsuo disclosed above; however, Matsuo is silent to using in-situ doping method for forming the indium doped polysilicon layer.

Yao et al. teach a method for forming a semiconductor device, which comprises forming the indium doped polysilicon layer by performing an in-situ indium ion doping during a chemical vapor deposition operation (col. 8, lines 5-25) or by ion implantation, see figs. 1-4; cols. 1-10 for more details.

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to use either in-situ doping method or ion implantation method to incorporate indium into the polysilicon as taught by Yao et al. in the method of Matsuo in order to lower the sheet resistance of the gate.

The further difference between the instant claims and the above prior art are as following: the above prior art is silent to using indium chloride as the dopant source for indium.

Gerritsen et al. teach a method for forming a semiconductor device, which comprises using gaseous indium chloride (col. 3, lines 5-21) as the dopant source for indium (i.e., the gaseous indium chloride is formed by heating the solid indium chloride to about 320 C), see figs. 1a-8 and cols. 1-8 for more details. In addition, using the indium chloride as the source for indium has been known in the art. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co., Inc. v. Interchemical Corp. , 325 U.S. 327, 65 USPQ 297 (1945). "Reading a list and selecting a

known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig - saw puzzle." 65 USPQ at 301.).

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to use any suitable dopant source for indium as taught by Gerritsen et al. in the method of Matsuo and Yao et al. in order to incorporate indium into the polysilicon such will improve the performance of the device.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Gerritsen et al. by selecting the suitable temperature, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Chen whose telephone number is (571)272-1689. The examiner can normally be reached on Monday-Friday (9:00am-6:30pm) alternate Monday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W Whitehead can be reached on (571)272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jack Chen
Primary Examiner
Art Unit 2813

October 7, 2004